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ABSTRACT

This paper reports on a 14-year follow-up study of two developmentally retarded Japanese children, a brother and sister, who had been kept shut up in a small shack before being rescued (at ages 5 and 6 respectively). Following birth they consistently suffered malnutrition, maternal deprivation, social isolation from adults, language deprivation, and cultural deprivation. However, there were almost no sensory-motor limitations and interactions between the children and their elder siblings were available to some extent. At the time of rescue, their heights and weights corresponded to those of an average 1-year-old and they were incapable of walking unaided. The research team designed special remedial programs for language, cognitive, socio-emotional, and motor development. After 3 years, their heights and motor skills caught up with standard levels. Remarkable early recoveries were observed in IQ development, but they soon stagnated at the 70-80 level. They performed poorly in complicated linguistic problem solving. In socio-emotional development, the girl developed a strong attachment to the nurse in charge, but the boy developed shallow attachments to everyone equally at first and had more behavioral problems as he grew older. Results suggest that sensory-motor ability and linguistic-logical ability are different and independent in their origins. (VW)

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LONG-TERM FOLLOW-UP STUDY OF CHILDREN DEVELOPMENTALLY RETARDED BY EARLY ENVIRONMENTAL DEPRIVATION

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1. The Case History

In October of 1972, two children, a 6-year-old girl and her 5-year-old brother, who had been kept shut up in a small shack, were rescued and reported as an extreme case of child abuse. At the time of their rescue, they were both measured to be 80 cm in height and 8.0 kg in weight, which, in comparison with the normal figures for Japanese children, corresponds to the figures for a physical age level of about one year old. This converts to a DQ of about 25 and they were incapable of walking unaided, and thus represents one of the most extreme cases of developmental retardation ever reported.

The sister and brother will hereafter be referred to as F. and G.

F. and G.'s tottering steps and G.' crawling are shown in their pictures of 1972.

2. Reasons for the Developmental Retardation

In regard to the possibility of genetic cause in such a case of extreme retardation, the children were subjected to examination by specialist physicians, but no specific signs attributable to gross hereditary abnormality could be found, except slight abnormality of syndactilia in early stage, 1973.

Fig.1 shows the Family Tree. The children's mother was from a middle-class family of the region, but her family line tended to be very prolific of children and she herself has given birth every year. Under such family circumstances, their father was quite lacking in ambition to work, exhibited lack of industry, weak will and immature personality; as a result, the family's poverty became fairly unbearable economically. When these children were born, the situation was at its worst, and the mother was overwhelmed by the burden of life physically and psychologically, and gradually became exhausted to the extent that she could not help giving up the caring for the children.

In the case of the father, because of his childish and immature personality, he was extremely dependent upon his wife, and he seemed to view the children as rivals in the fight for wife's affection. Furthermore, he strictly insisted that his wife provide only the minimum if care for the children.

Thus were F. and G. placed in an environment wherein following birth they consistently suffered malnutrition, maternal deprivation, social isolation from adults, language deprivation, and cultural deprivation. This total or complex environmental deprivation may be indicted as the major cause of the children's developmental retardation. But in comparison with many other similar cases including Genie, Isabelle, special characteristics of the present case are as follows: there were almost no sensory-motor limitations , and interactions between the children and their elder siblings were available, to some extent, in their environment.

After F. and G. were rescued, the research team made special remedial programs for language development, cognitive development, socio-emotional development, and motor development. The follow-up study has been done based on these programs for 14 years.

3. Physical Motor Development

In regard to physical development, the process of development of height (Fig.2., Fig.3., and Fig.4.) caught up with the standard with larger developmental gradient in comparison with the control children (Ka, Ki) at the same institution. F. is still a little lower than standard, but G. came up to the standard. The developmental process analysed according to velocity curve is shown in Fig.5. The velocity curve indicates that at the early period following rescue, a spurt of growth is obvious, and 18-year-developmental process of normal children was made about for 12-13 years. This may be considered as a sort of hyper-acceleration type of development. The impression is that the plasticity of growth is held as if it were in the state of hibernation.

In regard to motor development, after being rescued about for three years the children caught up with the standard of the same age by virtue of various motor skill tests and trainings. Development in this field was favorable and recovery was satisfactory. This proves that sensory-motor limitation for F. and G. was rather small.

Due to a spurt of growth at the early stage, F. and G. were accepted to be enrolled at regular elementary school after two years deferment.

4. Language Development

With respect to language development, there were differences between F. and G. at the early stage of rescue (Table 1.). It is uncertain whether the differences depend upon the sex difference in vulnerability or interaction of each other. After admittance there was obvious difference between F. and G. in terms of attachment formation. F.'s attachment formation to the nurse was much easier that that of G.'s. Nturally, this affected the development of social responses, that which affected the language development after all as a chain response and enlarged the difference between F. and G. as a result. Half a year after the rescue, those nurses who were much more compatible with F. and G. started to take care of them. After this, G.'s language development was remarkable, and the gap between F. and G. decreased rapidly. This suggests that the role of attachment is important as the precursor of language development. But linguistic retardation lingered, although great efforts have been made for remedial education. Fig.6. shows that the results of ITPA indicate 3-3.5 year retardation in comparison with chronological age. While retardation in daily use language was not so noticeable. One of the main symptoms of retardation lies in the most basic syntax ability and logical problem solving, such as active voice-passive voice conversion in grammar, for example. It may be said that after all linguistic retardation remained in internal speech (Vygotsky) or elaborated code (Bernstein).

5. Cognitive Development

In relation to the IQ development, remarkable recoveries were observed in Binet Test and WISC in the early stages, but soon both F. and G. stagnated at the IQ 70-80 level (Fig.7. and Fig.8.). Main causes for this are that the one is due to small span of STM (maximum 4), but

the other, much more important, is due to the low performance of complicated linguistic problem solving, which stems from the stagnancy of linguistic ability. It is, therefore, confirmed that a gap between PIQ and VIQ in WISC is gradually expanding. The control children (Ka, Ki) do not show the same type of stagnancy (Fig.9.). In other words, this retardation cannot be attributed to the environmental factors at the institution.

In the case of Standard Progressive Matrices, the children's performances surpassed 50 percentile and considered to be better than expected. This suggests that F. and G.'s disorders in sensory-motor ability or pattern perception ability were rather small, which coincided with the fact that sensory-motor restrictions were small in the children's environment. Piaget's theory that sensory-motor ability is the basis of logical ability (system of operation) is not appropriate in comparing the present case. Although the children were enrolled in elementary school with two years deferment, their academic achievements remained at the lowest level constantly. But F. and G. were accepted to enter into high school, where they made progress to some extent in academic achievement.

6. Socio-emotional Development

After admittance, F. and G. gradually adjusted themselves to the nursery school environment and peer relations. Especially, F. established a strong attachment to the nurse in charge. At the same time, various socio-emotional responses developed in keeping with the attachment. But in the case of G., attachment to the nurse in charge was not established at all at first. He attached to everyone equally with so-called shallow relationship at his early stage, therefore, G.'s socio-emotional development was not so smooth. It is considered that, as has been already seen in the section of language development, sex difference, the compatibility with the nurse in charge, difference of mothering and interactions with each other are the main reasons for the gap between F. and G. However, ever since G. was given a new and compatible nurse, the gap has started to decrease gradually. After admittance, when the children joined the group relations in the isntitution, their drawings changed dramatically (Fig.10.), which implies the enormous influences by peer group relations.

According to sociometric Test and Guess Who Test in their elementary school days, they remained as isolates in their class groups, especially G.'s sociometric ranking was extremely low. Although they were unsociable, thay did not exhibit typical antisocial or delinquent behaviors as a whole. Even G.'s antisocial episodes might be considered in the category of maladjusted behavior in the course of normal development. G. showed low aggression consistently, and he could not resist his friends even younger than his age. While, asocial tendencies in F. gradually decreased after her entrance into elementary school. In her high school days, she maintained good peer group relations and her teacher's evaluation of F. improved considerably.

G, joined the field and track club at junior high school, which helped to ameliorate his heretofore non-adaptive pattern of behavior, but the existence of asocial pattern in G. was very

deep-rooted in comparison with F. It seems that the consistency of deep-rooted asocial pattern in G. stems partly from individual characteristics of himself, and partly from early social isolation per se as well.

7. Conclusion

1) Hypothesis of critical period in the human development concerning language aquisition and attachment formation in the human development was not confirmed; in other words, a critical period in the strict sense of the word is not valid in the present case. But there is a possibility that the deep-rooted asocial pattern in G. stems from lack of attachment in the earliest stage of development.

2) As has been already seen typically in physical development, we hypothesize that the living organism, when placed in an inappropriate environment enters a kind of dormant state while retaining the potential for development. It is suggested that human development is not a simple process of maturation but an amazing plasticity exists in the human developmental process.

3) Attachment formation in the early stage plays a role of main precursor of physical growth, language acquisition, and acquisition of social responses. In this sense, attachment has a key role in the early stage of development. It seems that this role is effective only by attachment to adult caretaker, and the attachment to the same age sibling cannot be substituted for this role.

4) It is suggested that sensory-motor ability, and linguistic and logical ability are different and independent of each other in their origin of genesis.

5) It is hoped that long-term follow-up studies should be done as long as possible in order to draw a definite conclusion from developmental phenomena.

6) It is necessary for this type of case study to be compared with similar cases in order to reach a valid conclusion. It is therefore hoped that long-term follow-up studies and detailed reports will continue to appear and be available.

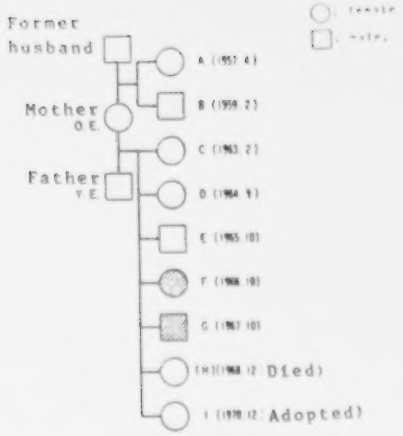


Fig.1 The Family Tree.
A parenthesized digit shows
the birth month and year.

F's tottering steps
(6 years and 2 months)
December,1972.

G's tottering steps
(5 years old and 2 months)
December,1972

G's crawling
(5 years and 2 months)
December,1972.

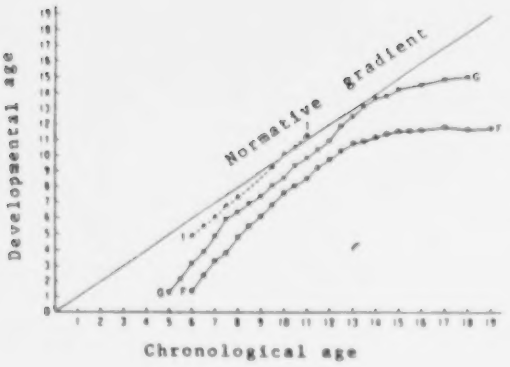


Fig.2 Development of height of F,G,I;Compared with normative developmental gradient.

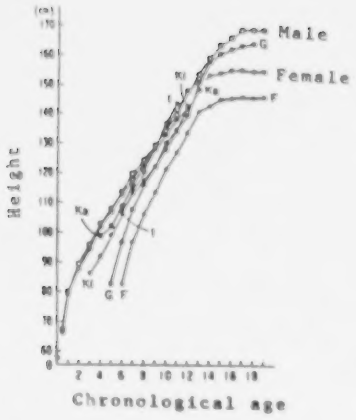


Fig.4 Development of height of F,G,I and the control children(Ka,Ki);Compared with the national average.

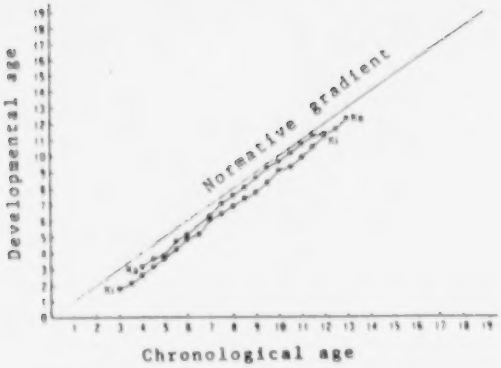


Fig.3 Development of height of the control children(ka,Ki);Compared with normative developmental gradient.

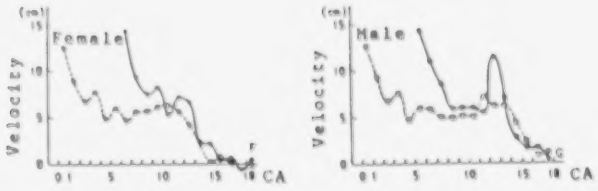


Fig.5 Velocity curve of height; Compared with the national average.

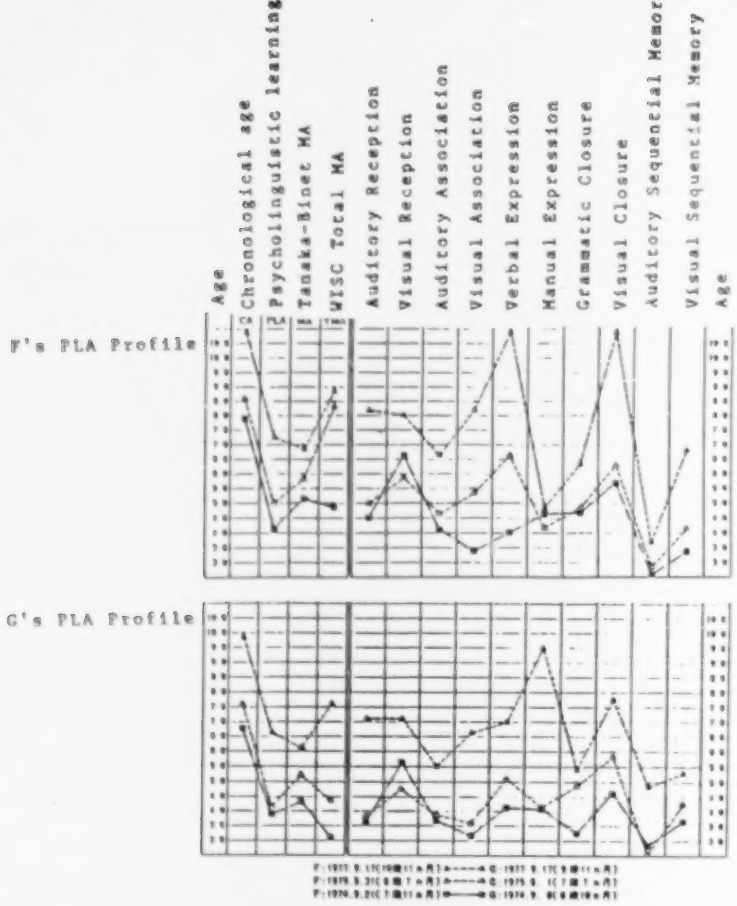


Fig.6 ITPA: Illinois Test of Psycholinguistic Abilities; Comparison of the profile based on PLA

Table 1. Status of Language Skill Development in F. and G. During Segment II (January to March, 1973).

Item	F.	G.
Vocabulary development (Jan. 20, 1973)	74	20
Longest syntactic structure	Three-word phrases (January 8); Freely makes two- and three-word phrases.	Two-word phrases (January 20); Most utterances are single words.
Communication with adults	Quite free of problems; has no trouble with social situations.	Mostly one-sided, from the adult side alone; often fails to understand adult's question, and frequently makes no answer.
Communication with peers	Starts to show interaction with peers (Jan. 8); empathy, aggression, etc., also are observed; identification and naming of friends also exhibited.	Hardly observed.
Communication between F. & G.	Shows no special interest in G.	Shows no interest in F.
Uninterpretable utterances	Extremely few.	Extremely common.
Echolalia/parroting	Most speech is spontaneous (social speech).	Most speech is echolalia.
"Baby talk"	Common.	Extremely common.
Mispronunciations	Observed.	Extremely common.
Sentence forming ability	Can use terminating postfixes (Nov. 1); subject particles (Jan. 8); other particles, infinitives, imperatives, participles—freely uses grammatical constructions in response to the situation (Jan. 20).	Cannot yet use particles; stereotyped usage of infinitives and participles is seen.

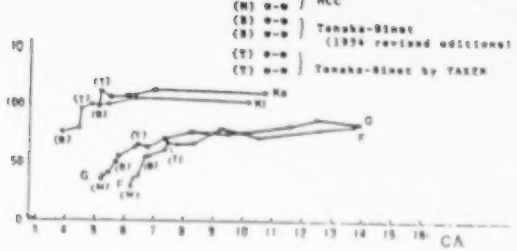


Fig.7 IQ development by Tanaka-Binet
IQ Test;F,G,and the control children
(Ka,Ki).

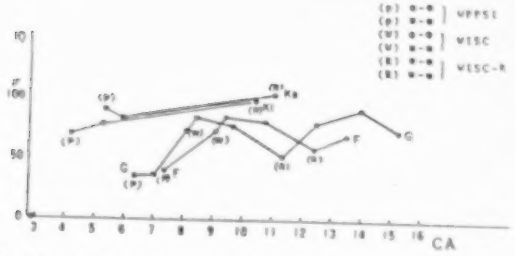


Fig.8 IQ development of WISCs:
F,G, and the control children(Ka,Ki).

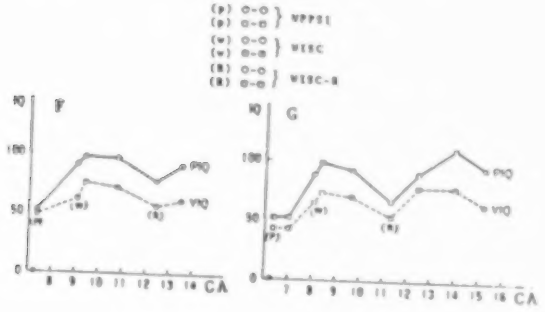
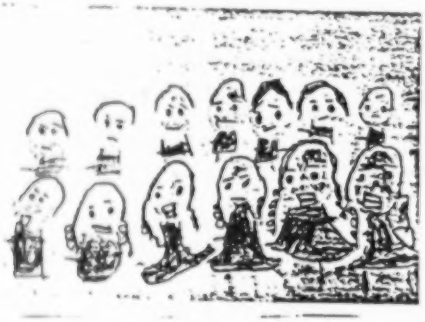


Fig.9 Comparison of VIQ with PIQ by WISCs

Drawing by F (September,1973)



Drawing by F (November,1974)

Fig.10 Development of Drawing Ability

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